

## ABSTRACT OF THE DISCLOSURE

5 An optical cross connect, especially a wavelength cross connect, using free-space optics, a diffraction grating, and a micro electromechanical systems (MEMS) array of movable mirrors. A concentrator receives light from widely separated optical fibers and brings the beams together into a more closely spaced linear array. Free-space optics process all the beams. Front-end optics collimate the beams from the fibers and flatten their fields. The diffraction grating spectrally separates each beam into sub-beams. A long-focus lens focuses the sub-beams onto  
10 the 2-dimensional MEMS array. A fold mirror reflectively couples two such mirrors, whereby the switched signals propagate back through the same optics and are spectrally recombined onto the fibers. Other embodiments include white-color cross connects, multiple MEMS arrays, and parallel optics. Power dividers or wavelength interleavers can divide signals from the fibers, and multiple cross connects switch different wavelength groups.